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**Okazawa**

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(54) **PRINTING SYSTEM, PRINTING METHOD, AND COMPUTER PROGRAM**

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Nov. 29, 2002 (JP) ..... 2002-348728

(51) **Int. Cl.**
***G06F 15/00*** (2006.01)
*G06F 3/12* (2006.01)

(52) **U.S. Cl.** ..... **358/1.15**; 358/1.13

(58) **Field of Classification Search** ..... 358/1.2, 358/1.9, 1.13, 1.14, 1.15, 402, 448; 709/201, 709/217, 220, 221, 224, 230
See application file for complete search history.

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(57) **ABSTRACT**

A printing system includes a print control device, a network interface device, and an information processing device. The information processing device acquires configuration information of the network interface device from the network interface device connecting the print control device to a network, and generates print data representing the configuration information of the network interface device based on the acquired configuration information. The printing system thus prints out the configuration information of the network interface device.

**13 Claims, 16 Drawing Sheets**

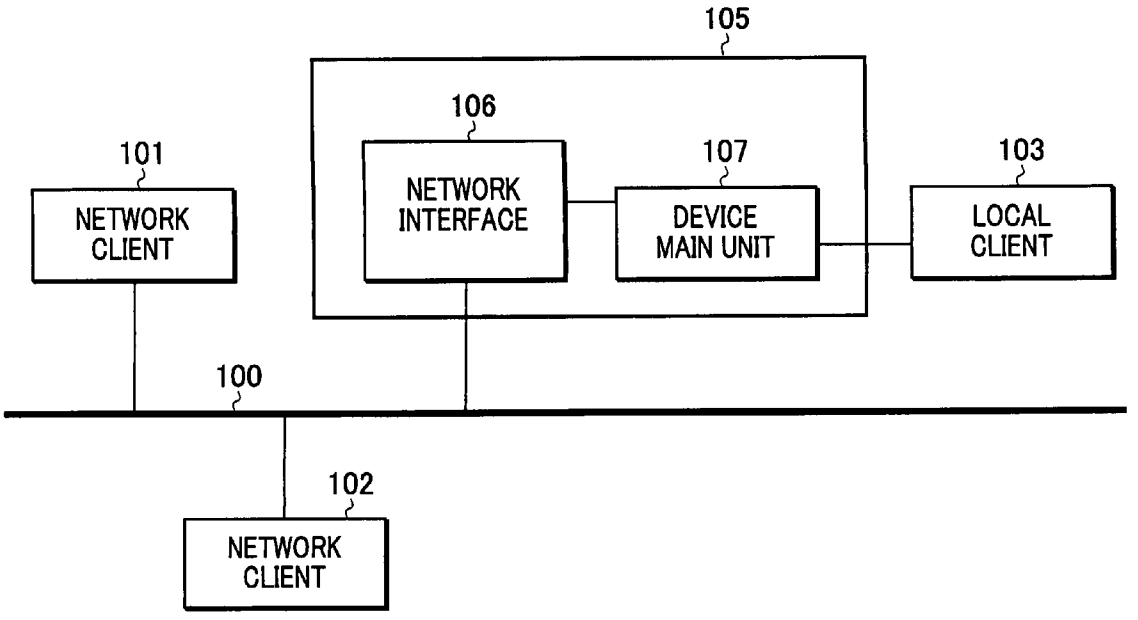


FIG. 1

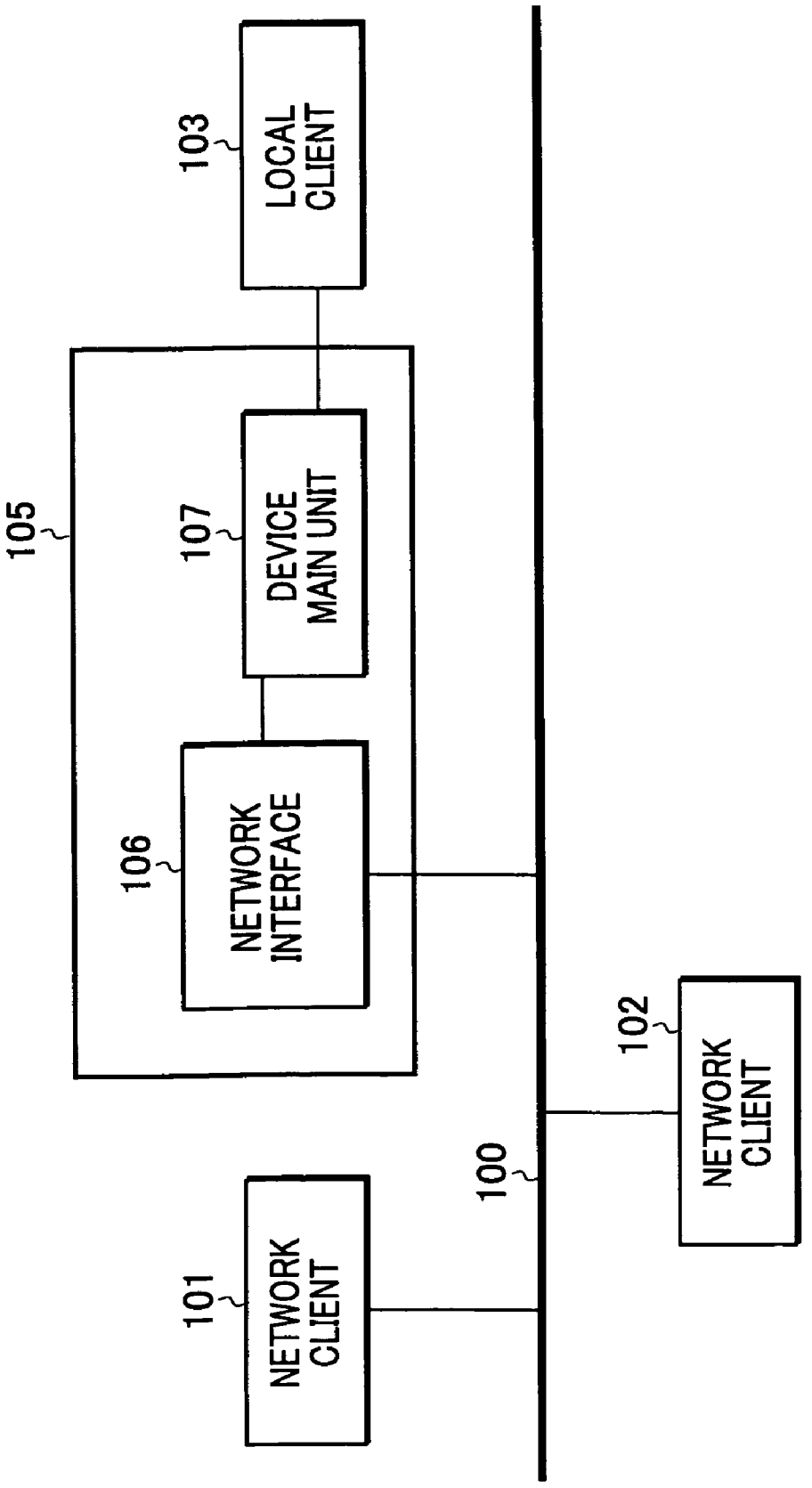

103
LOCAL CLIENT
105
107
DEVICE MAIN UNIT
106
NETWORK INTERFACE
102
NETWORK CLIENT
100
101
NETWORK CLIENT

FIG. 2

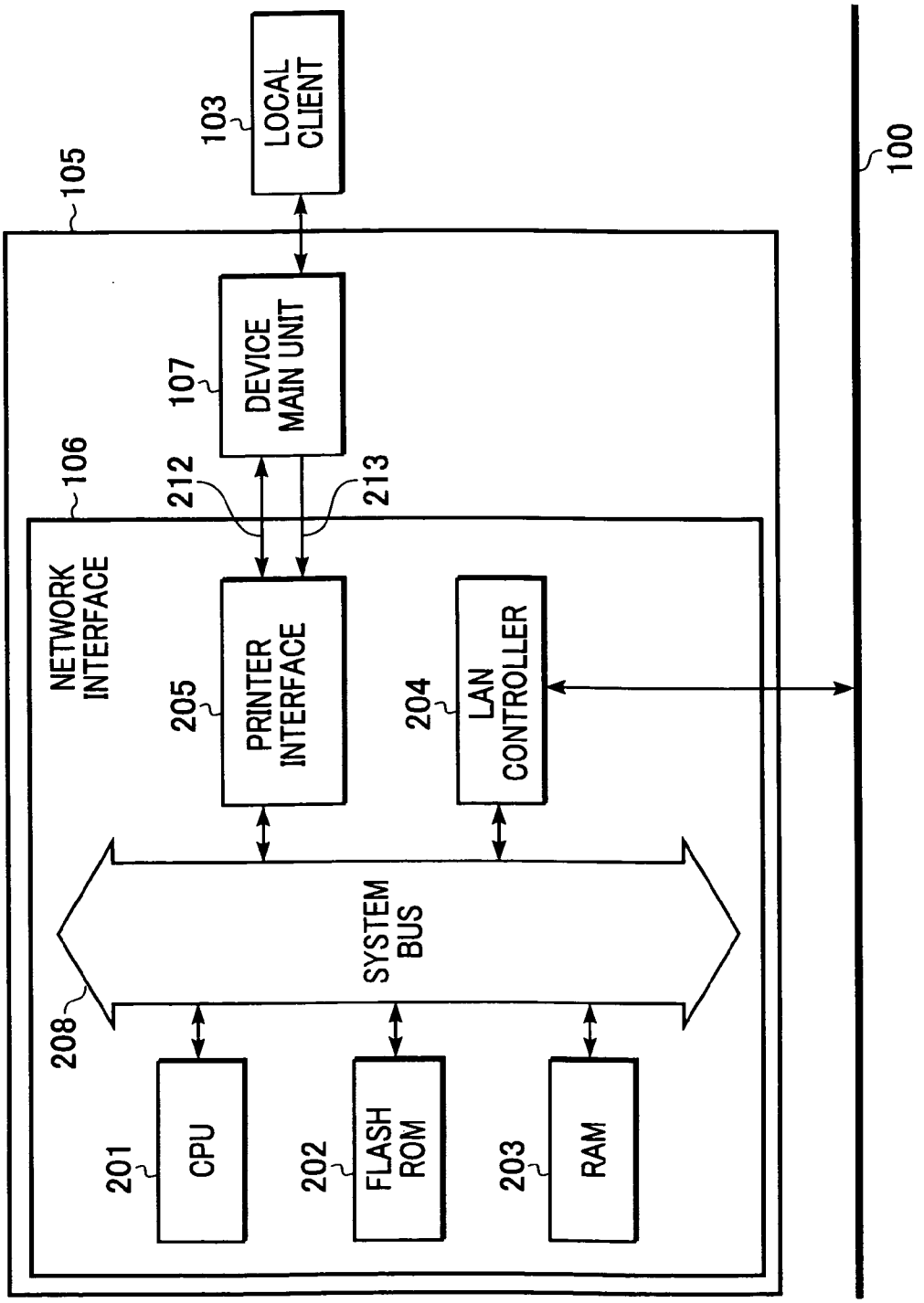

100
105
103
LOCAL CLIENT
DEVICE MAIN UNIT
107
106
212
213
NETWORK INTERFACE
PRINTER INTERFACE
205
LAN CONTROLLER
204
SYSTEM BUS
208
CPU
201
FLASH ROM
202
RAM
203

FIG. 3A

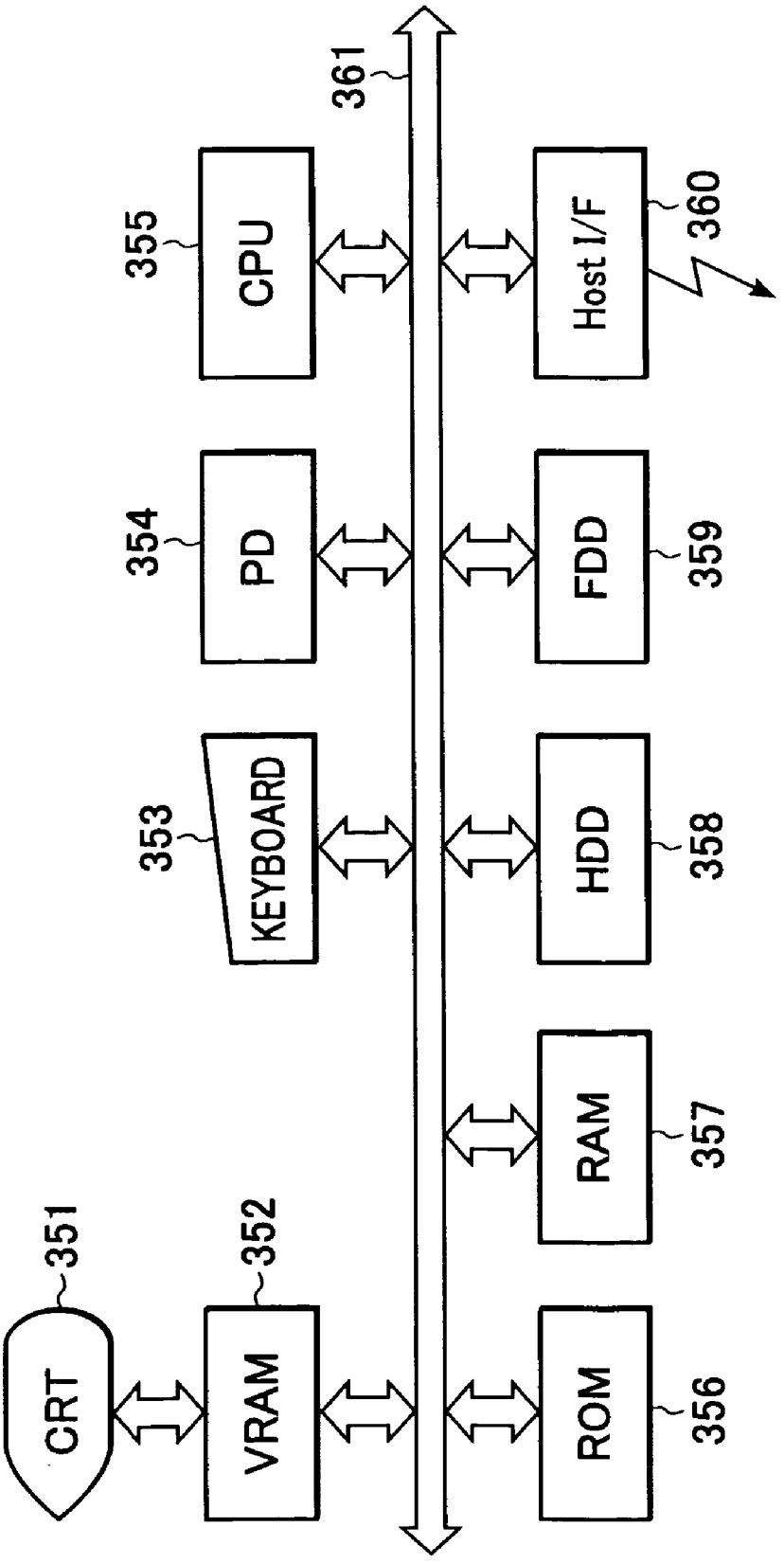

361
355
CPU
Host I/F
360
354
PD
FDD
359
353
KEYBOARD
HDD
358
RAM
357
351
352
CRT
VRAM
ROM
356

FIG. 3B

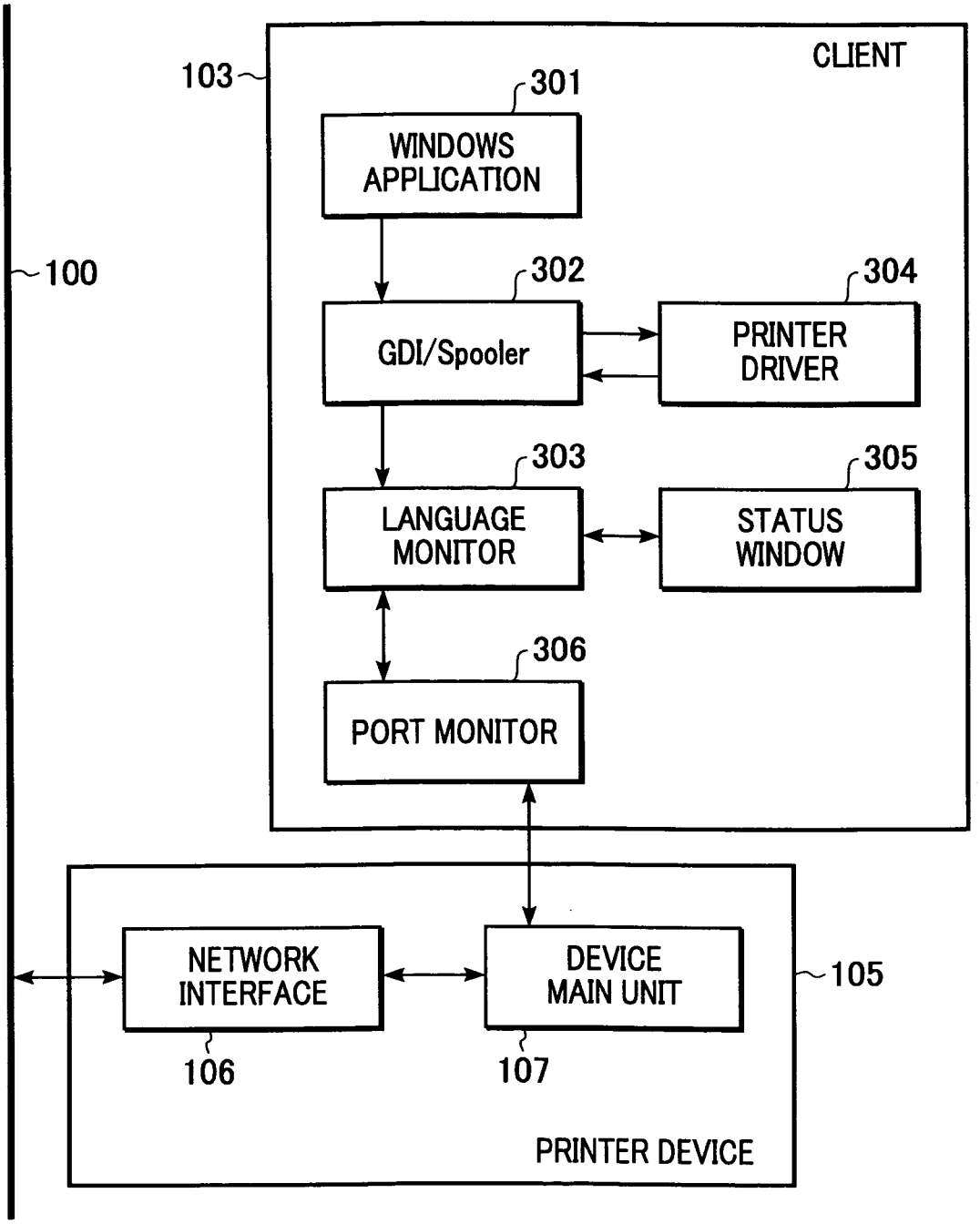

CLIENT
103
301
WINDOWS APPLICATION
100
302
304
GDI/Spooler
PRINTER DRIVER
303
305
LANGUAGE MONITOR
STATUS WINDOW
306
PORT MONITOR
NETWORK INTERFACE
DEVICE MAIN UNIT
105
106
107
PRINTER DEVICE

FIG. 4

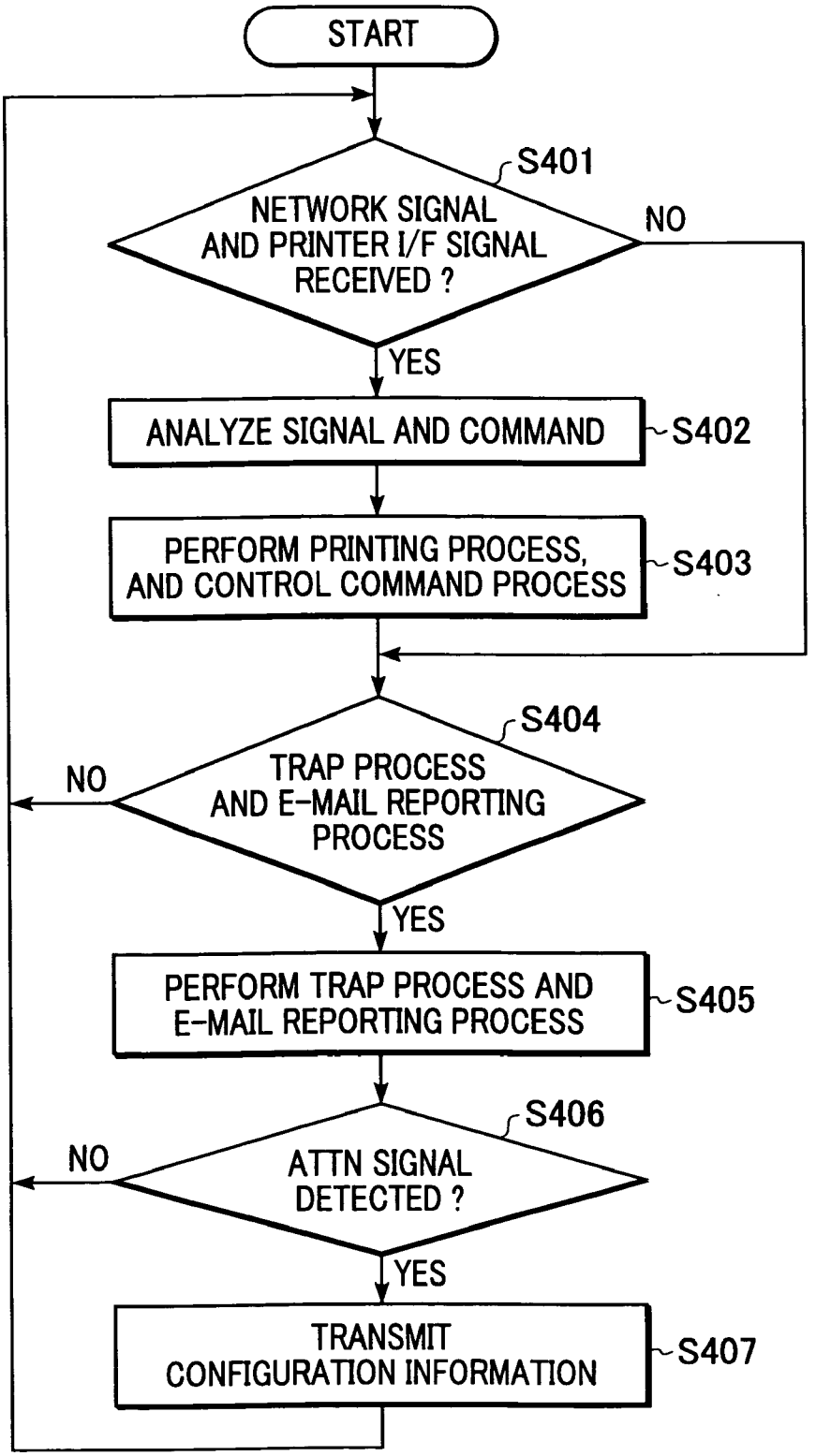

START
S401
NETWORK SIGNAL AND PRINTER I/F SIGNAL RECEIVED ?
NO
YES
ANALYZE SIGNAL AND COMMAND
S402
PERFORM PRINTING PROCESS, AND CONTROL COMMAND PROCESS
S403
S404
TRAP PROCESS AND E-MAIL REPORTING PROCESS
NO
YES
PERFORM TRAP PROCESS AND E-MAIL REPORTING PROCESS
S405
S406
ATTN SIGNAL DETECTED ?
NO
YES
TRANSMIT CONFIGURATION INFORMATION
S407

FIG. 5

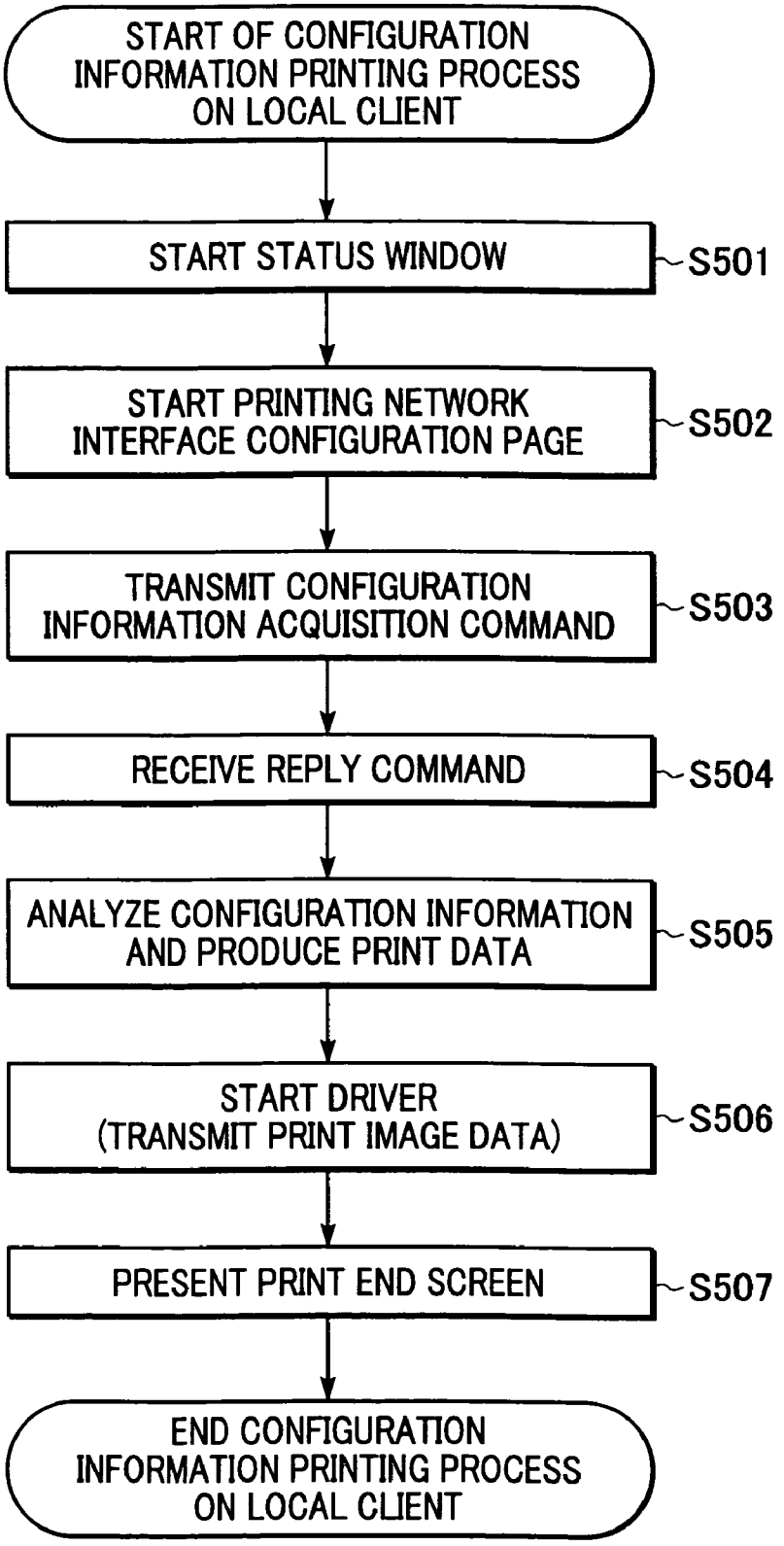

START OF CONFIGURATION INFORMATION PRINTING PROCESS ON LOCAL CLIENT
START STATUS WINDOW
S501
START PRINTING NETWORK INTERFACE CONFIGURATION PAGE
S502
TRANSMIT CONFIGURATION INFORMATION ACQUISITION COMMAND
S503
RECEIVE REPLY COMMAND
S504
ANALYZE CONFIGURATION INFORMATION AND PRODUCE PRINT DATA
S505
START DRIVER (TRANSMIT PRINT IMAGE DATA)
S506
PRESENT PRINT END SCREEN
S507
END CONFIGURATION INFORMATION PRINTING PROCESS ON LOCAL CLIENT

FIG. 6

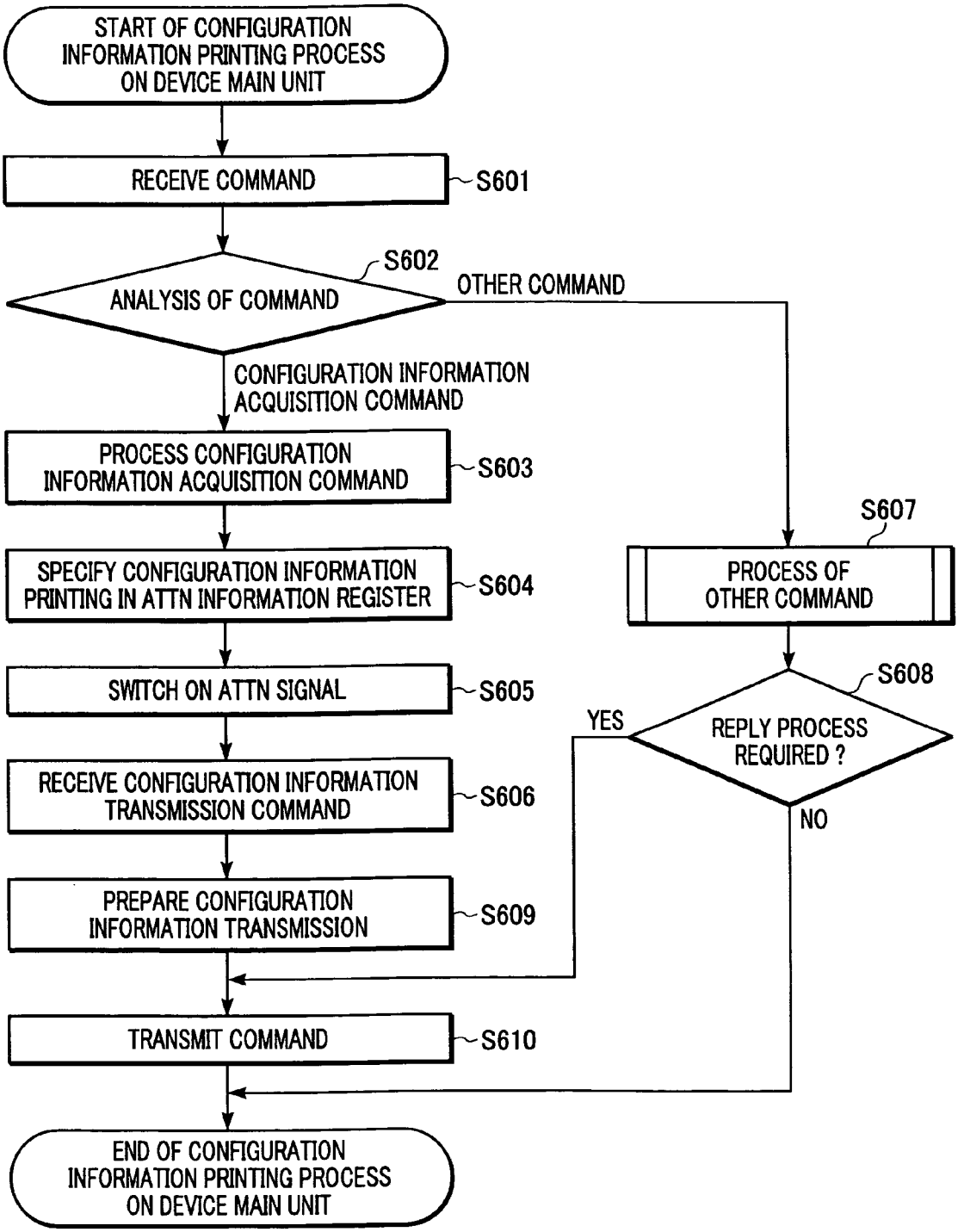

START OF CONFIGURATION INFORMATION PRINTING PROCESS ON DEVICE MAIN UNIT
RECEIVE COMMAND
S601
ANALYSIS OF COMMAND
S602
OTHER COMMAND
CONFIGURATION INFORMATION ACQUISITION COMMAND
PROCESS CONFIGURATION INFORMATION ACQUISITION COMMAND
S603
SPECIFY CONFIGURATION INFORMATION PRINTING IN ATTN INFORMATION REGISTER
S604
SWITCH ON ATTN SIGNAL
S605
RECEIVE CONFIGURATION INFORMATION TRANSMISSION COMMAND
S606
PREPARE CONFIGURATION INFORMATION TRANSMISSION
S609
TRANSMIT COMMAND
S610
END OF CONFIGURATION INFORMATION PRINTING PROCESS ON DEVICE MAIN UNIT
PROCESS OF OTHER COMMAND
S607
REPLY PROCESS REQUIRED ?
S608
YES
NO

FIG. 7

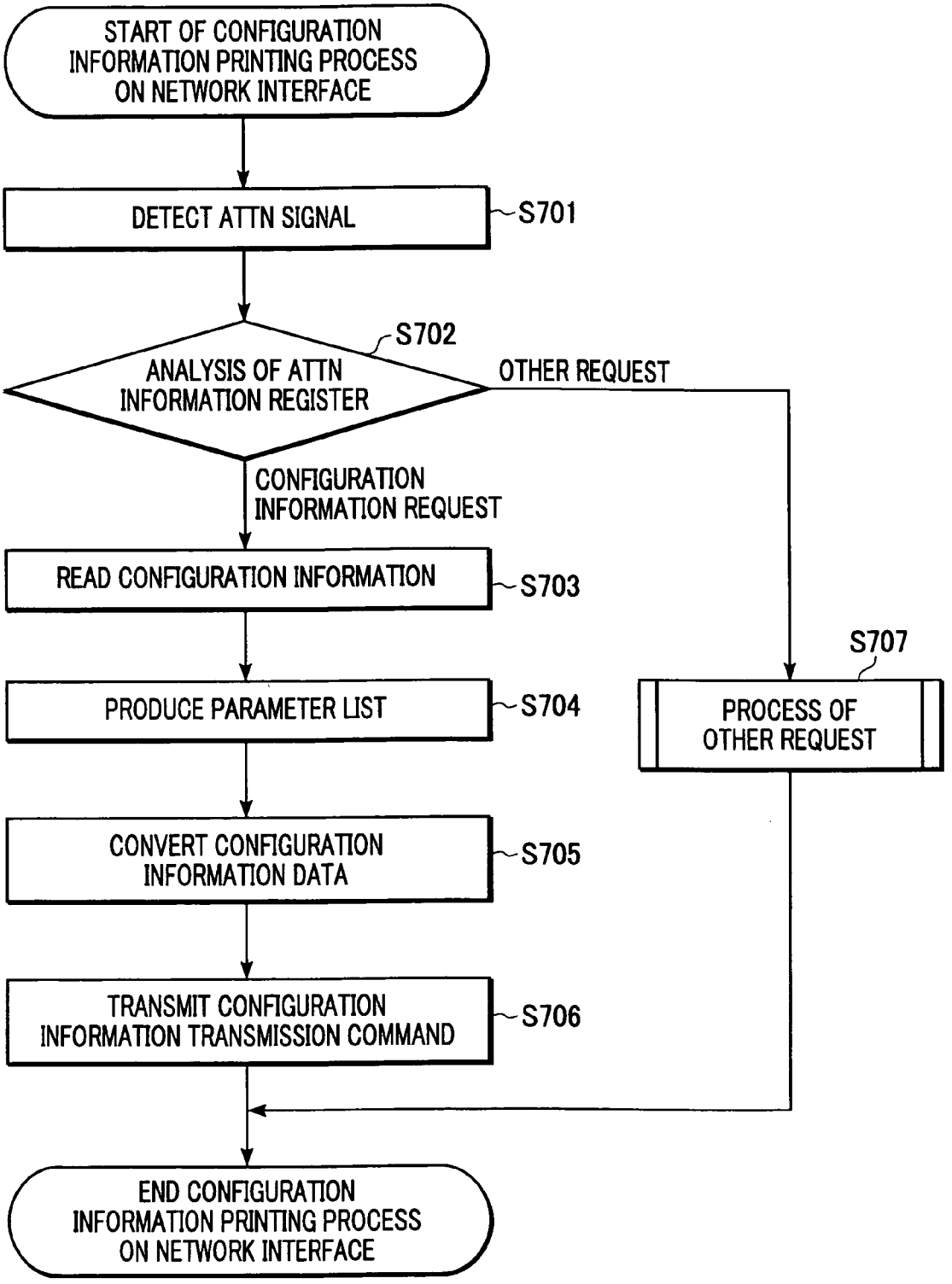

START OF CONFIGURATION INFORMATION PRINTING PROCESS ON NETWORK INTERFACE
DETECT ATTN SIGNAL
S701
S702
ANALYSIS OF ATTN INFORMATION REGISTER
OTHER REQUEST
CONFIGURATION INFORMATION REQUEST
READ CONFIGURATION INFORMATION
S703
S707
PRODUCE PARAMETER LIST
S704
PROCESS OF OTHER REQUEST
CONVERT CONFIGURATION INFORMATION DATA
S705
TRANSMIT CONFIGURATION INFORMATION TRANSMISSION COMMAND
S706
END CONFIGURATION INFORMATION PRINTING PROCESS ON NETWORK INTERFACE

FIG. 8

```
MODEL NAME OF NETWORK ADAPTOR : NB-XX
#-----
MODEL NAME : LASER SHOOT P-XXXX
ACTIVE LANGUAGE : ENGLISH
CAPT I/F VERSION : 2.01
INTERFACE : Fast Ethernet 10/100 BaseT
DATA RATE : 10/100 Mbps
MAC ADDRESS : 00 : 00 : 85 : XX : XX : XX
FIRMWARE VERSION : 1.00 beta
CANON-MIB VERSION : 2.50

GENERAL INFORMATION
        PRINT SERVER NAME : OANON112008

TCP/IP
        TCP/IP : Enabled
        IP ADDRESS : 192. 168. 3. 215
        SUB-NETMASK : 255. 255. 255. 0
        GATEWAY ADDRESS : 192. 168. 3. 1
        DHCP : OFF
        BOOTP : OFF
        RARP : OFF
        DNS SERVER ADDRESS : 192. 168. 3. 2
        DNS SERVER DYNAMIC UPDATING : OFF
        DNS HOST NAME : OANON112008
        DNS DOMAIN NAME : oanon.co.jp
        SMTP SERVER NAME : smtpsvr.oanon.co.jp
        WINS SERVER ADDRESS : 192. 168. 3. 3
        SCOPE ID : AAAAAAAAAA.BBBBBBBBBB.CCCCCCCCCC
        SNMP ACCESS : ON
        COMMUNITY CHARACTER STRING : smtpsvt.oanon.co.jp
        NTP SERVER NAME : 192. 168. 3. 4
NetBIOS
        BASE PROTOCOL : NetBEUI
TCP/IP PRINT LIMITATIONS
        PRINT LIMITATION : ON
        PRINT LIMITATION MODE : PRINTING FROM DESIGNATED
                                ADDRESS PERMITTED
        PRINT LIMITATION DESIGNATING ADDRESS :
        :
        :
TCP/IP SETTING LIMITATIONS
        SETTING LIMITATION : ON
        SETTING LIMITATION MODE : SETTING FROM DESIGNATED
                                  ADDRESS DENIED
        SETTING LIMITATION DESIGNATING ADDRESS :
        :
        :

[EOF]
```

FIG. 9

CONFIG PRINT NB-XX

| | |
|---|---|
| MODEL NAME | : LASER SHOOT P-XXXX |
| ACTIVE LANGUAGE | : ENGLISH |
| CAPT I/F VERSION | : 2.01 |
| INTERFACE | : Fast Ethernet 10/100 BaseT |
| DATA RATE | : 10/100 Mbps |
| MAC ADDRESS | : 00 : 00 : 85 : XX : XX : XX |
| FIRMWARE VERSION | : 1.00 beta |
| CANON-MIB VERSION | : 2.50 |
| GENERAL INFORMATION | |
| PRINT SERVER NAME | : OANON112008 |
| TCP/IP | |
| TCP/IP | : Enabled |
| IP ADDRESS | : 192. 168. 3. 215 |
| SUB-NETMASK | : 255. 255. 255. 0 |
| GATEWAY ADDRESS | : 192. 168. 3. 1 |
| DHCP | : OFF |
| BOOTP | : OFF |
| RARP | : OFF |
| DNS SERVER ADDRESS | : 192. 168. 3. 2 |
| DNS SERVER DYNAMIC UPDATING | : OFF |
| DNS HOST NAME | : OANON112008 |
| DNS DOMAIN NAME | : oanon.co.jp |
| SMTP SERVER NAME | : smtpsvr.oanon.co.jp |
| WINS SERVER ADDRESS | : 192. 168. 3. 3 |
| SCOPE ID | : AAAAAAAAAA.BBBBBBBBBB.CCCCCCCCCC |
| SNMP ACCESS | : ON |
| COMMUNITY CHARACTER STRING | : smtpsvt.oanon.co.jp |
| NTP SERVER NAME | : 192. 168. 3. 4 |
| NetBIOS | |
| BASE PROTOCOL | : NetBEUI |
| TCP/IP PRINT LIMITATIONS | |
| PRINT LIMITATION | : ON |
| PRINT LIMITATION MODE | : PRINTING FROM DESIGNATED ADDRESS PERMITTED |
| PRINT LIMITATION DESIGNATING ADDRESS | : |
| | : |
| | : |
| TCP/IP SETTING LIMITATIONS | |
| SETTING LIMITATION | : ON |
| SETTING LIMITATION MODE | : SETTING FROM DESIGNATED ADDRESS DENIED |
| SETTING LIMITATION DESIGNATING ADDRESS | : |
| | : |
| | : |

FIG. 10

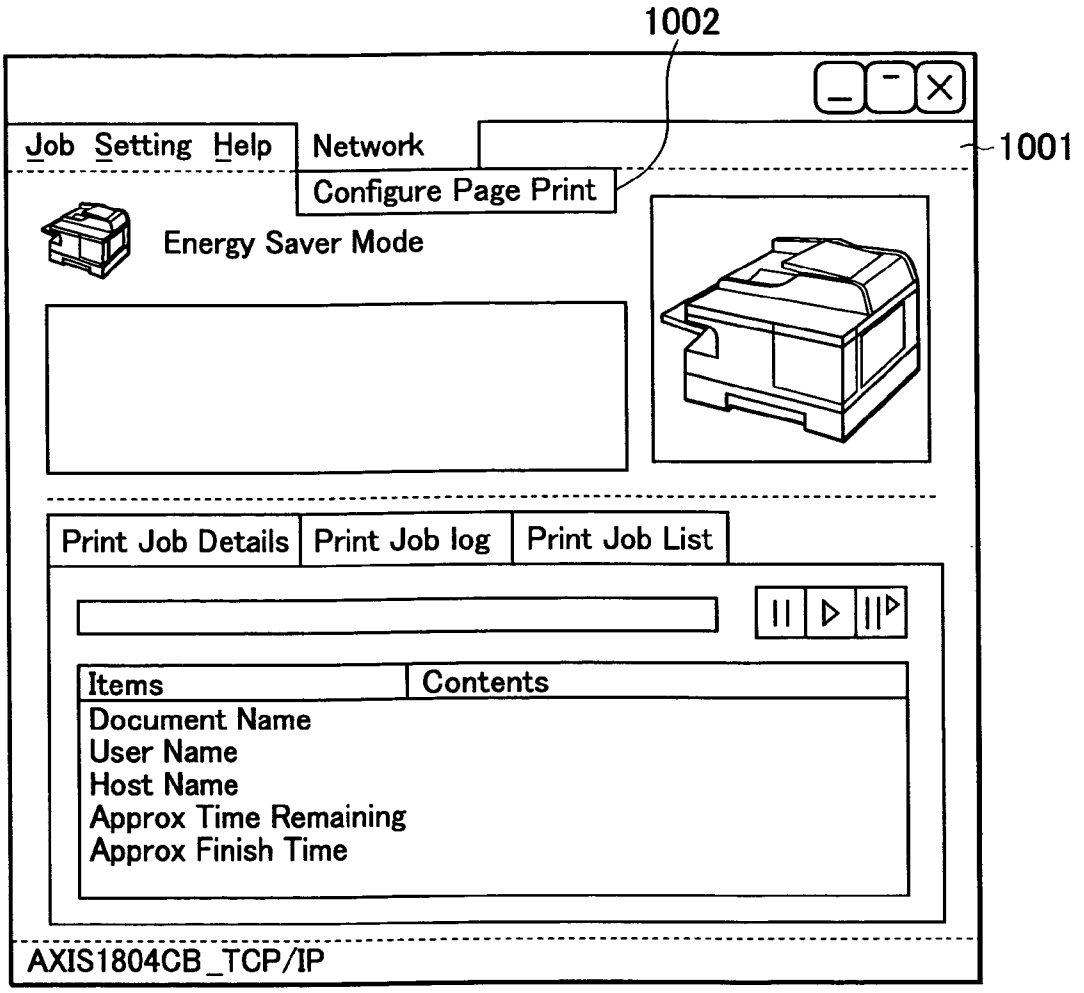

1002
1001
Job Setting Help
Network
Configure Page Print
Energy Saver Mode
Print Job Details
Print Job log
Print Job List
Items
Contents
Document Name
User Name
Host Name
Approx Time Remaining
Approx Finish Time
AXIS1804CB_TCP/IP

FIG. 11

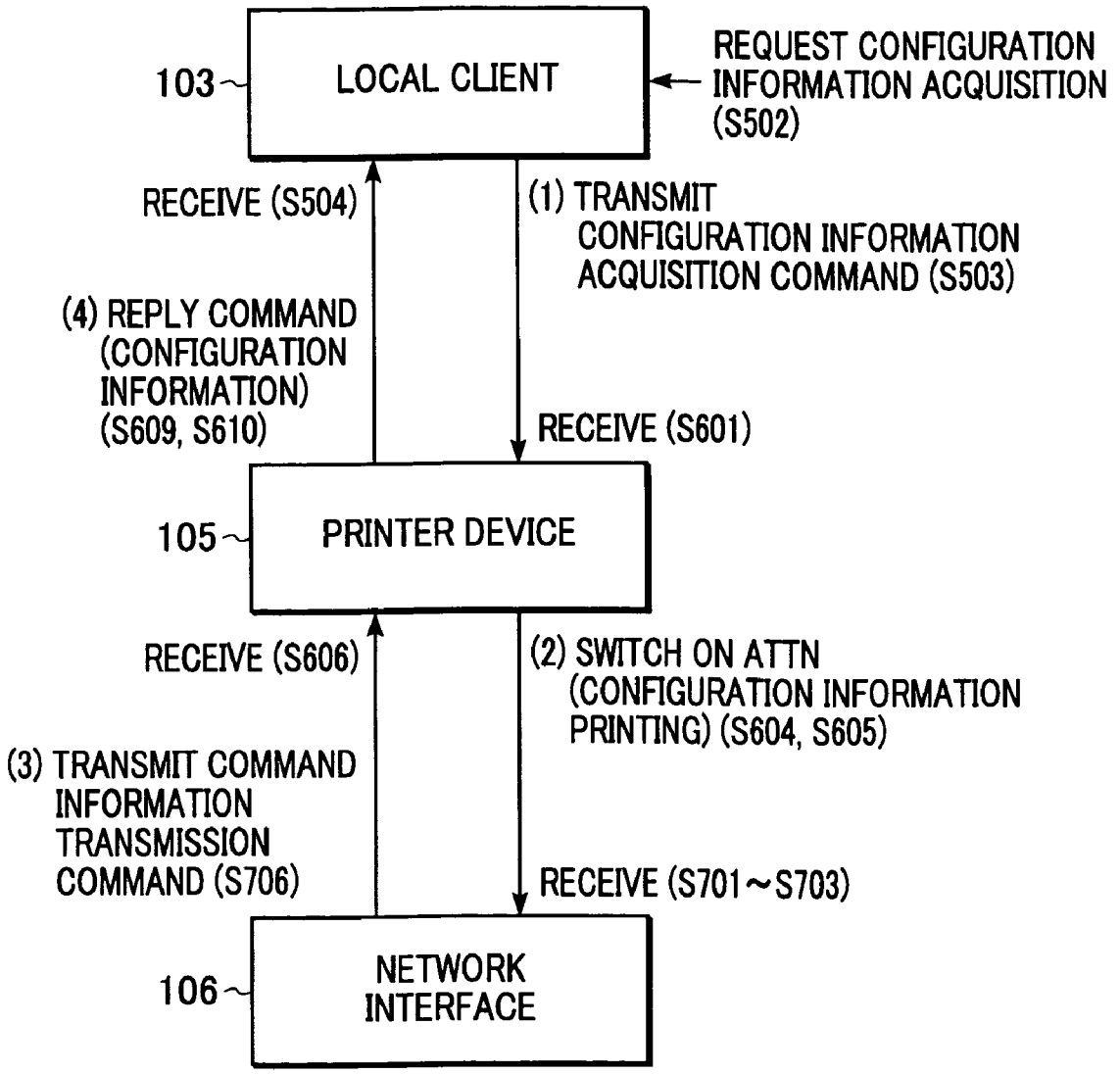

103
LOCAL CLIENT
REQUEST CONFIGURATION INFORMATION ACQUISITION (S502)
RECEIVE (S504)
(1) TRANSMIT CONFIGURATION INFORMATION ACQUISITION COMMAND (S503)
(4) REPLY COMMAND (CONFIGURATION INFORMATION) (S609, S610)
RECEIVE (S601)
105
PRINTER DEVICE
RECEIVE (S606)
(2) SWITCH ON ATTN (CONFIGURATION INFORMATION PRINTING) (S604, S605)
(3) TRANSMIT COMMAND INFORMATION TRANSMISSION COMMAND (S706)
RECEIVE (S701~S703)
106
NETWORK INTERFACE

FIG. 12

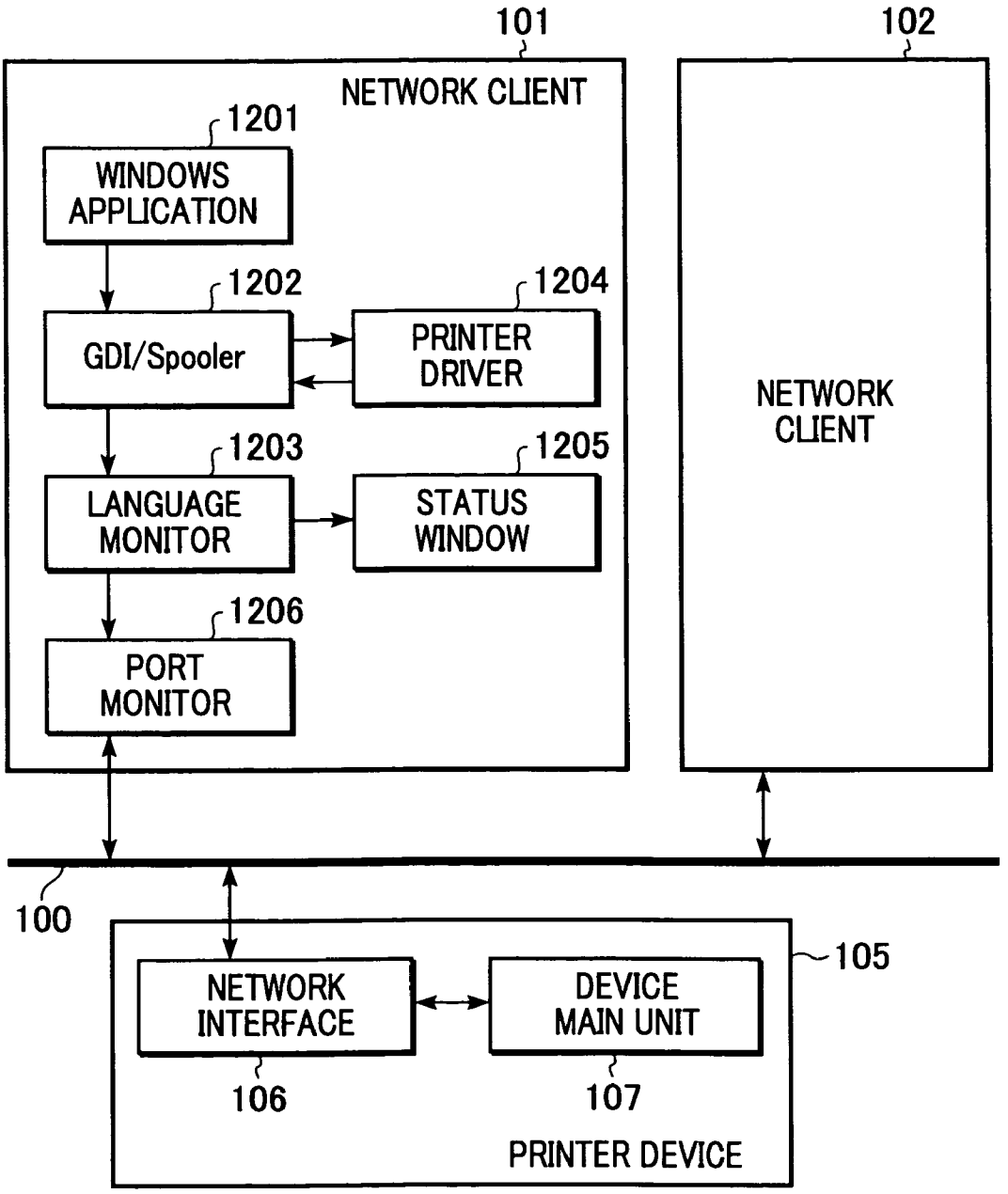

101
102
NETWORK CLIENT
1201
WINDOWS APPLICATION
1202
GDI/Spooler
1204
PRINTER DRIVER
1203
LANGUAGE MONITOR
1205
STATUS WINDOW
1206
PORT MONITOR
NETWORK CLIENT
100
105
NETWORK INTERFACE
DEVICE MAIN UNIT
106
107
PRINTER DEVICE

FIG. 13

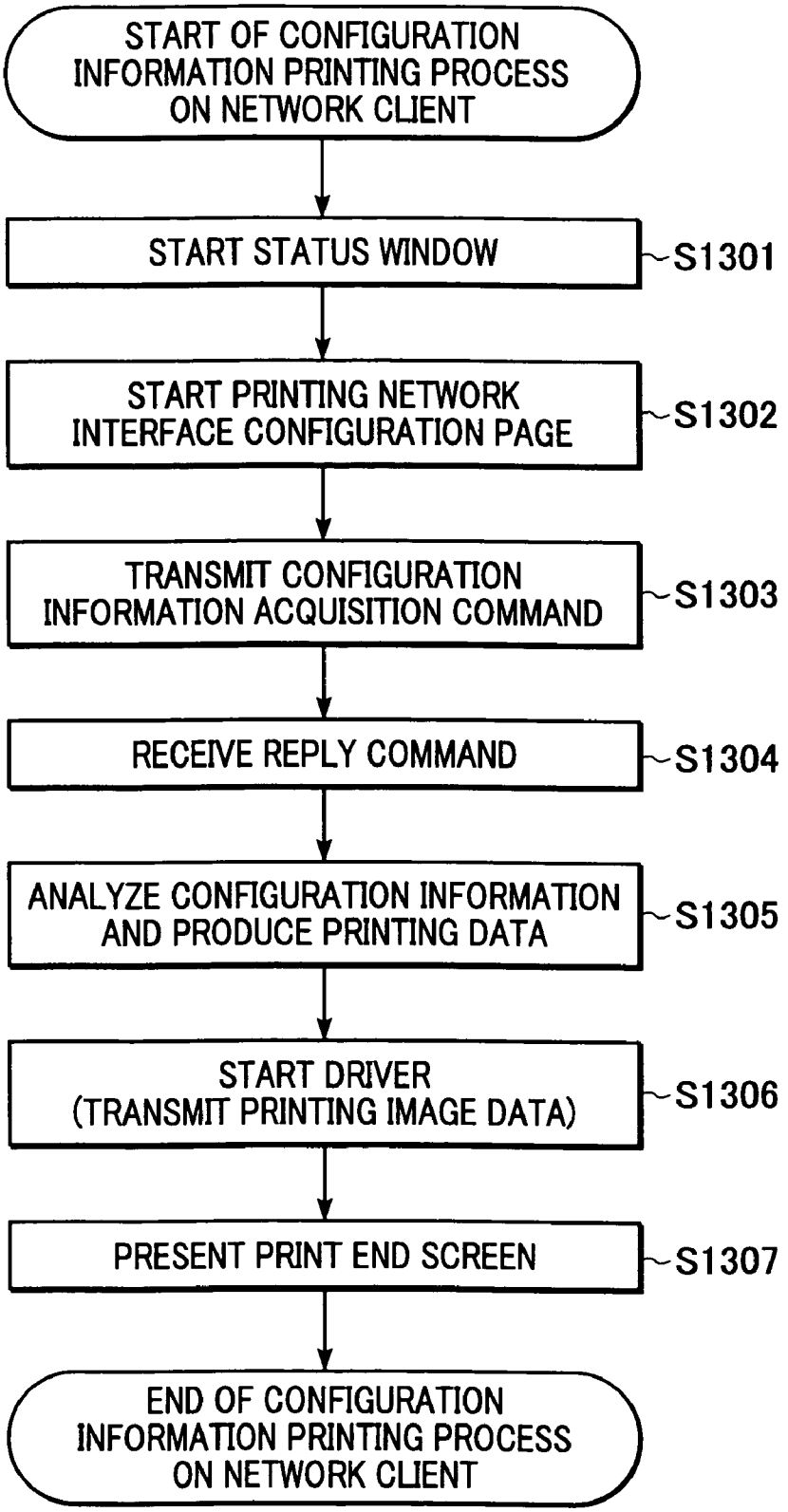

START OF CONFIGURATION INFORMATION PRINTING PROCESS ON NETWORK CLIENT
START STATUS WINDOW
S1301
START PRINTING NETWORK INTERFACE CONFIGURATION PAGE
S1302
TRANSMIT CONFIGURATION INFORMATION ACQUISITION COMMAND
S1303
RECEIVE REPLY COMMAND
S1304
ANALYZE CONFIGURATION INFORMATION AND PRODUCE PRINTING DATA
S1305
START DRIVER (TRANSMIT PRINTING IMAGE DATA)
S1306
PRESENT PRINT END SCREEN
S1307
END OF CONFIGURATION INFORMATION PRINTING PROCESS ON NETWORK CLIENT

FIG. 14

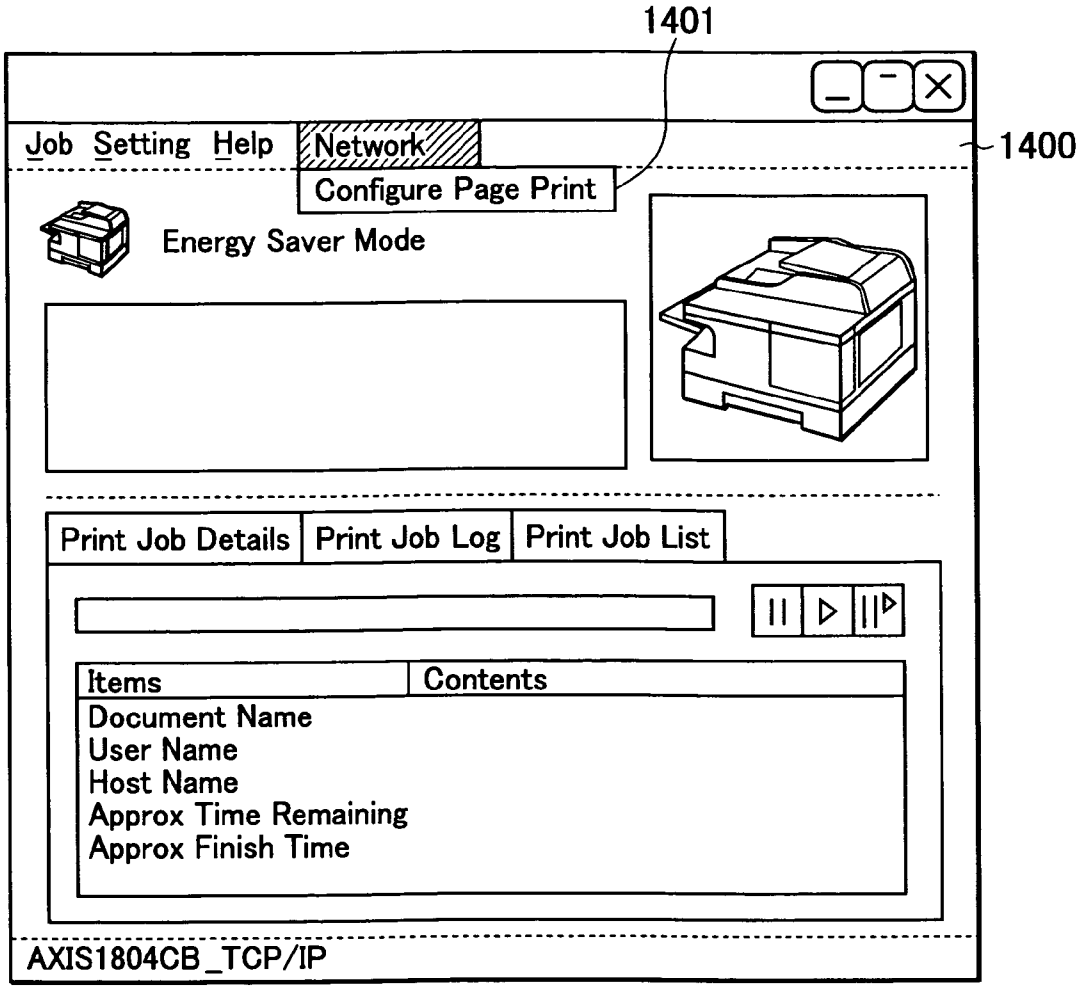
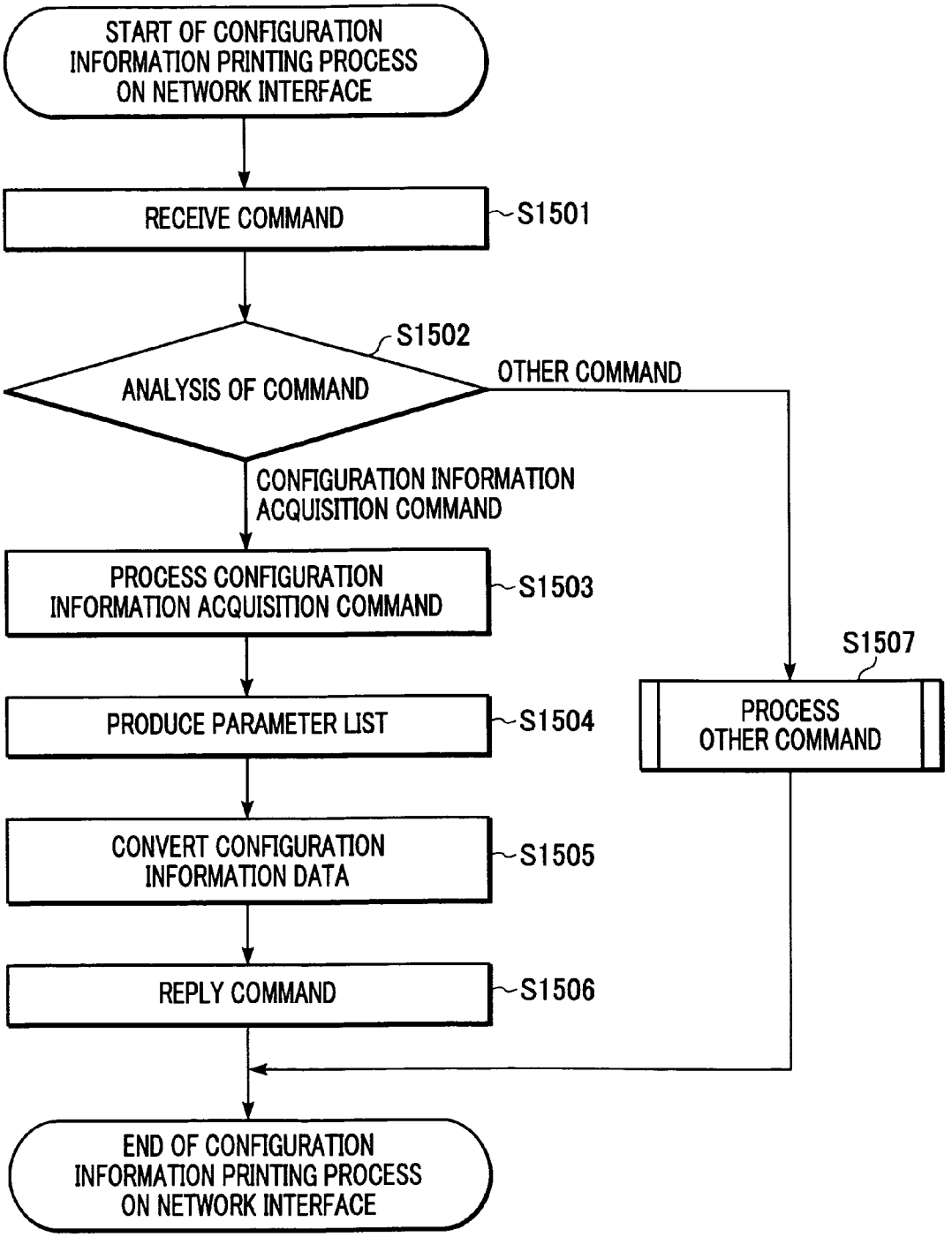

1401
1400
Job Setting Help
Network
Configure Page Print
Energy Saver Mode
Print Job Details
Print Job Log
Print Job List
Items
Contents
Document Name
User Name
Host Name
Approx Time Remaining
Approx Finish Time
AXIS1804CB_TCP/IP

FIG. 15


START OF CONFIGURATION INFORMATION PRINTING PROCESS ON NETWORK INTERFACE
RECEIVE COMMAND
S1501
S1502
ANALYSIS OF COMMAND
OTHER COMMAND
CONFIGURATION INFORMATION ACQUISITION COMMAND
PROCESS CONFIGURATION INFORMATION ACQUISITION COMMAND
S1503
PRODUCE PARAMETER LIST
S1504
CONVERT CONFIGURATION INFORMATION DATA
S1505
REPLY COMMAND
S1506
S1507
PROCESS OTHER COMMAND
END OF CONFIGURATION INFORMATION PRINTING PROCESS ON NETWORK INTERFACE

# PRINTING SYSTEM, PRINTING METHOD, AND COMPUTER PROGRAM

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a technique appropriate for use in a printing system including a printer device, a network interface for connecting the printer device to a network, and an information processing device.

2. Description of the Related Art

Two types of connection methods for connecting an information processing device (hereinafter referred to as a client device) such as personal computer to a printer device are known. In one connection type, a client device is connected to a printer device through a network (a network connection configuration). In the other connection type, a client device is directly connected to a printer device without a network (a local connection configuration). The client device that is connected to the printer device in the network configuration is hereinafter referred to as a network client, and the client device that is connected in the local connection configuration is hereinafter referred to as a local client.

In the network connection configuration, the printer device includes a network interface, and a print controller as a device main unit. The device main unit is connected to a network through the network interface. The network interface communicates information over the network between the device main unit and a network client terminal present on the network. In the local connection configuration, the device main unit communicates with a local client connected through an interface (i.e., Centronics or USB) that is different from the network interface.

A host base system with a device main unit having no page description language (PDL) is available as a system composed of a client device and a printer device. In the host base system, the client device generates and compresses print image data, and transfers the compressed image data to the printer device. The device main unit of the printer device decompresses the compressed image data and transfers the resulting image data to a printer engine for printing. Such a host base system is different from a printing system that has a device main unit having the function of interpreting a PDL.

To allow a user to check environment setting information of the network interface (configuration information), the configuration information is typically printed out. The configuration information of the network interface is preferably printed out using the device main unit. In an already accepted technique, printing of the configuration information is performed in a system where the device main unit has the function of PDL interpretation. In this case, the network interface transfers PDL data (print data in a PDL format) to the device main unit, and the device main unit expands the PDL data into image data to print the data. In other words, the configuration information is printed without performing information communications over the network.

To print out the configuration information on the above-described host base system, a print image must be transferred to the device main unit. Even if the network interface transfers PDL formatted print data, the device main unit is unable to print out the PDL formatted print data.

Typically, the network interface has no function to directly generate image data from the PDL formatted print data. The host base system has been unable to print the configuration information with the network interface and the device main unit.



## SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system and a method for printing configuration information of a network interface in a more efficient and easier fashion than the conventional art.

The present invention in a first aspect relates to a printing system and includes a print control device, a network interface device for connecting the print control device to a network, an information processing device which is connected to the print control device through an interface different from the network interface device, an acquisition unit, arranged in the print control device, for acquiring configuration information of the network interface device from the network interface device, a transmitting unit for transmitting the configuration information acquired by the acquisition unit from the print control device to the information processing device through the interface different from the network interface device, and a generating unit, arranged in the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information transmitted from the transmitting unit.

The present invention in a second aspect relates to a printing system and includes a print control device, a network interface device for connecting the print control device to a network, an information processing device which is connected to the network, an acquisition unit, arranged in the information processing device, for acquiring configuration information of the network interface device from the network interface device through the network, and a generating unit, arranged in the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information acquired by the acquisition unit.

The present invention in a third aspect relates to a printing method for printing configuration information of a network interface device that connects a print control device to a network, and includes an acquisition step, performed by the print control device, for acquiring the configuration information of the network interface device from the network interface device, a transmitting step for transmitting the configuration information acquired in the acquisition step from the print control device to an information processing device through an interface different from the network interface device, a generating step, performed by the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information transmitted in the transmitting step, a print data transmitting step for transmitting the print data generated in the generating step from the information processing device to the print control device through the interface different from the network interface device, and a printing step for printing the print data transmitted in the print data transmitting step.

The present invention in a fourth aspect relates to a printing method for printing configuration information of a network interface device that connects a print control device to a network, and includes an acquisition step, performed by an information processing device, for acquiring the configuration information of the network interface device from the network interface device through the network, a generating step, performed by the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information acquired in the acquisition step, a first print data transmitting step for transmitting the print data generated

in the generating step from the information processing device to the network interface device through the network, a second print data transmitting step for transmitting the print data, transmitted in the first print data transmitting step, from the network interface device to the print control device, and a printing step for printing the print data transmitted in the second print data transmitting step.

The present invention in a fifth aspect relates to a computer program for printing configuration information of a network interface device that connects a print control device to a network, and includes program codes for performing an acquisition step for acquiring, through an interface different from the network interface device, the configuration information of the network interface device from the print control device that has acquired the configuration information, and a generating step for generating print data representing the configuration information of the network interface device based on the configuration information acquired in the acquisition step.

The present invention in a sixth aspect relates to a computer program for printing configuration information of a network interface device that connects a print control device to a network, and includes program codes for performing an acquisition step, performed by an information processing device, for acquiring the configuration information of the network interface device from the network interface device through the network, and a generating step, performed by the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information acquired in the acquisition step.

Further objects, features, and advantages of the present invention will be apparent from the following description of the preferred embodiments with reference to the attached drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a system configuration of a network system of preferred embodiments of the present invention.

FIG. **2** is a block diagram illustrating a structure of a network interface of FIG. **1**.

FIG. **3**A is a block diagram illustrating a hardware configuration of a local client of FIG. **1**.

FIG. **3**B is a functional block diagram of the local client of FIG. **1**.

FIG. **4** is a flow diagram illustrating a process of the network interface of FIG. **1**.

FIG. **5** is a flow diagram illustrating a configuration information printing process of the local client.

FIG. **6** is a flow diagram illustrating a configuration information printing process of a device main unit of FIG. **1**.

FIG. **7** is a flow diagram illustrating a configuration information printing process of the network interface of FIG. **1**.

FIG. **8** illustrates an example of configuration information data.

FIG. **9** illustrates a printout of the configuration information data of FIG. **8**.

FIG. **10** illustrates a screen example of a status window of a network client of FIG. **3**B.

FIG. **11** illustrates a flow of commands and information in a printing operation of the configuration information of the network interface.

FIG. **12** is a block diagram of a structure of network clients of FIG. **1**.

FIG. **13** is a flow diagram illustrating a configuration information printing process of the client device of FIG. **12**.

FIG. **14** illustrates a screen example of a status window in the client device of FIG. **12**.

FIG. **15** is a flow diagram illustrating a process of printing the configuration information of the network interface of FIG. **12**.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention are discussed with reference to the drawings.

In the preferred embodiments, a network interface device (hereinafter simply referred to as a network interface) transfers configuration information thereof to an information processing device such as a host terminal through a printer device, and the information processing device produces a print job (namely, print image data) based on the configuration information, and transfers the print job to the printer device. The configuration information is thus printed.

A printing system of the preferred embodiments of the present invention includes a printer device, a network interface that connects the printer device to a network, and a client device that is connected to the printer device in a local connection. In response to an acquisition request, the printer device acquires the configuration information from the network interface, and transmits the acquired configuration information to the client device through the local connection. The client device generates print data (the print job) representing the received configuration information. The configuration information is thus presented to the user.

The configuration information is printed by transmitting the print image generated by the client device to the printer device through the local connection. The configuration information is not only printed out but also presented on a display.

The printer device of a preferred embodiment of the printing system includes a first connection for connecting the client device in the local connection, and a second connection for connecting to a network interface connectable to a network. In response to an acquisition command, the configuration information is acquired from the network interface through the second connection, and the acquired configuration information is then transferred to the client device through the first connection.

The information processing device (a local client) of a preferred embodiment of the printing system is connected to the printer device through the local connection. The information processing device requests the printer device connected through the local connection to send predetermined information. Upon receiving the predetermined information from the printer device through the local connection, the information processing device generates a print job based on the predetermined information.

The embodiments of the present invention are discussed in detail.

FIG. **1** illustrates a system configuration of a network system of one embodiment of the present invention. Each of client devices **101** through **103** is a personal computer, for example. The client device devices **101** and **102** are network clients connected to a network **100**, and the client device **103** is a local client connected to a device main unit **107** of a printer device **105** through a local connection.

Also shown in FIG. **1** is a network interface **106** of printer device **105**. The network interface **106**, for example, is a network board or a network card. Device main unit **107**, in addition to being connected to local client **103**, is also connected to each of the network client devices **101** and **102** through the network interface **106** and the network **100**.

FIG. **2** is a block diagram illustrating a structure of the network interface **106** of FIG. **1**. As shown, a CPU **201** controls each block of the network interface **106** via control programs stored in a flash ROM **202**. The flash ROM **202** is partially reprogrammable, and serves as a storage area for a variety of parameters, including control programs and data. RAM **203** temporarily stores working data and parameters used by the CPU **201**. The configuration information is stored in one of either the flash ROM **202** or the RAM **203** and is set and modified in response to a manual operation carried out on an operation panel, now shown, of the device main unit **107** or a command input from the outside. The configuration information may be stored in a non-volatile RAM (NVRAM) (not shown) instead of the flash ROM **202**.

A LAN controller **204** communicates with the external network **100** using Ethernet® or token ring. The present invention is not limited to either of these communication protocols and any communication protocol that would allow practice of the present invention is applicable. Print image data from a client connected to the network **100** is input under the control of the LAN controller **204**. In addition to the print image data, any other information or data network interface **106** exchanges with the network **100** are done through the LAN controller **204**.

The printer interface **205** transmits a print job input from the external network **100** to the device main unit **107**, transmits and receives printer control jobs, acquires status information of the device main unit **107**, acquires device information concerning the device main unit **107**, and enters settings on the device main unit **107**. A TX/RX channel **212** conducts print data and control data in the printer interface **205**. An attention (ATTN) signal **213** is transmitted from the device main unit **107** to the network interface **106**. To transmit the ATTN signal **213**, a new signal line may be added or the ATTN signal **213** may be handled as ATTN as a new command.

A system bus **208** interconnects the CPU **201**, the flash ROM **202**, the RAM **203**, the LAN controller **204**, and the printer interface **205**.

FIG. **3**A is a block diagram illustrating a data processing device as a local client device. A display **351** (cathode-ray tube, liquid-crystal display, etc.) displays information being processed by an application software program running on the local client device, as well as a variety of messages, and a graphical user interface that consists of among things menu and button options. Video RAM (VRAM) **352** is used to expand images that are to be displayed on the display **351**. A keyboard **353** and a pointing device (PD) **354** are used to input characters on a predetermined section on the display **351** and to point to an icon or a button on a graphical user interface (GUI) displayed on display **351**. A CPU **355** controls the entire data processing device.

ROM **356** stores the operational programs (procedures) that the CPU **355** executes. Among the programs stored in ROM **356** is an application program for processing data, an error processing program, and programs relating to the flow diagrams of the present invention discussed below. RAM **357** serves as a working area of the CPU **355** that executes a variety of programs and as a temporary saving area for error processing.

A hard disk drive (HDD) **358** and a floppy disk drive (FDD) **359** store application programs, data, libraries, etc. Instead of, or in addition to the FDD **359**, an optical disk drive for a CD-ROM, a magneto-optical (MO) disk, digital versatile disk (DVD), a magnetic tape drive for a tape streamer, or DDS may be used.

A host interface **360** is used to connect to a printing device such as a printer. The host interface **360** is used as the TX/RX channel **212** and for the ATTN signal **213** previously described. The above-referenced elements of the local client device are all interconnected via an I/O bus **361** (including an address bus, a data bus, and a control bus).

The network client device has the same structure as discussed with reference to FIG. **3**A, and further includes a network interface for connection with a network.

FIG. **3**B is a functional block diagram of the local client **103** of FIG. **1** (FIG. **3**A). The local client **103** preferably uses the Windows® operating system, but any operating system that would allow practice of the present invention is applicable.

Windows® application **301** is a typical application program such as Microsoft Word® or Microsoft Excel®. A GDI/Spooler **302** acts as an interface between the application **301** and a printer driver **304**, and one of its tasks is to perform a spooling function.

A language monitor **303** divides the print data generated by the printer driver **304** on a page-basis, and performs a screen process, a print order process, a collation process, a multi-copying process, and a sheet size management process for selecting a sheet feeder on the print data. The resulting print data is transferred to a printer port **306**. The language monitor **303** also monitors the status of the printer device, and provides a status manager (not shown) with the printing status.

The printer driver **304** generates image data in a bit-map format in accordance with a command from the application, compresses the image data, and outputs the compressed image data. A status window **305** receives printer device status information from the language monitor **303**, and displays the status information on a screen (i.e., display **351**). The status window **305** also transfers a job control request to the language monitor **303**. A port monitor **306** communicates with the device main unit **107** of printer device **105** through an interface such as a parallel interface, a Centronics interface, or a USB interface.

The configuration information of the network interface **106** is printed using the device main unit **107** in the host base system described above in accordance with the preferred embodiment of the present invention. The printing operation of the host base system is discussed below.

FIG. **4** is a flow diagram illustrating a process of the network interface **106**. In its standard process, the network interface **106** typically performs steps S**401** through S**405** as shown in FIG. **4**. Upon receiving a network signal from the network **100** or a printer I/F signal from the printer interface **205**, the network interface **106** proceeds from step S**401** to step S**402**. The network interface **106** analyzes the received signal and command in step S**402**, and performs processes corresponding to the received signal and command (namely, a printing process and a control command process) in step S**403**. When print data is received from the network **100**, the print data is then transferred to the device main unit **107**.

The network interface **106** also performs processes on a non-periodic basis (step S**404**). These processes include a trap process for notifying the printer device of a status change, and an e-mail reporting process for reporting a log of the printer device through e-mail (step S**405**). When performing these processes, if the network interface **106** requires information concerning the printer device, the information is acquired through the printer interface **205**.

In this preferred embodiment, if the printer interface **205** detects the ATTN signal **213** transmitted from the device main unit **107**, the request for the configuration information from the printer device is recognized (step S**406**). When the request

for the configuration information is recognized, the configuration information is organized and then transmitted to the device main unit **107** (step S**407**). This process is discussed in detail below with reference to FIG. **7**. The configuration information is then transferred to the local client **103**.

The process of the network interface **106** described above is repeated in response to the detection results in each of steps S**401**, S**404**, and S**406**. A print job is generated based on the transferred configuration information. As a result, the host base system previously described prints the configuration information (configuration information page) of the network interface **106** without using the network.

FIG. **5** is a flow diagram illustrating a configuration information printing process of the local client **103**. As explained above, installed in the local client **103** are the printer driver **304**, the language monitor **303**, and the status window **305**, which are required to use the printer device. The status window **305** is an application for presenting the status information of the printer device on the display **351** of the local client **103**. FIG. **10** illustrates an example of a graphical user interface **1001** displayed on display **351** by the status window **305** of the network **103** client. The language monitor **303** acquires the status information of the printer device **105** from the device main unit **107** through the printer port (port monitor **306**) in accordance with control commands communicated between the local client **103** and the device main unit **107**. Upon receiving the status information, the status window **305** presents the status information on the display **351** of the local client **103**.

When the loading of the network interface **106** in the printer device **105** is detected, a menu **1002** for commanding the printing of the configuration information page of the network interface **106** is added to the graphical user interface **1001** generated by the status window **305**.

Returning to FIG. **5**, the status window **305** is started in step S**501**. The status window **305** presents the menu **1002** for commanding the printing of the configuration information. By selecting the menu **1002**, a print command to print the configuration information is issued (step S**502**). Alternatively, a button for printing the configuration information may be presented instead of the menu **1002**.

The status window **305** communicates with the language monitor **303**, thereby transmitting the print command to the language monitor **303** (step S**503**). The same process is followed to suspend the job. More specifically, commands are exchanged between the language monitor **303** and the status window **305**, and the configuration information print command is added to these commands. The language monitor **303** issues a configuration information acquisition command as one of printer control commands through the printer port (port monitor **306**).

In step S**504**, the language monitor **303** waits for a reply in response to the configuration information acquisition command. As will be discussed later with reference to FIG. **6**, the reply command includes the configuration information of the network interface **106**. Upon receipt of the reply command in step S**504**, the language monitor **303** analyzes the configuration information included in the reply command, and generates print data (step S**505**). The language monitor **303** generates the print data in the same way any other application typically generates print data. More specifically, the configuration information is converted into GDI data, which is then sent to a spooler. In step S**506**, as is in the case of a typical printing operation, the printer driver **304**, converts the GDI data into a print image that is printable on the printer device **105**, and then transmits the print image data to the printer device **105**. When a status monitor detects a print end state, a screen (not shown) displaying the configuration information print end state is displayed (step S**507**). The process of the local client **103** is then completed.

FIG. **6** is a flow diagram illustrating a configuration information printing process of the device main unit **107**. The device main unit **107** receives and analyzes print data, print commands, and control commands transmitted from the local client **103** (information processing device) (steps S**601** and S**602**). If, in step S**602**, the device main unit **107** determines that the command is other than a configuration information acquisition command, it performs respective processes in response to the command (step S**607**). For example, when the print data is received, the device main unit **107** prints the print data. Next, in step S**608**, a determination is made whether the command received in step S**601** requires a reply. When a command requiring a reply is received, the device main unit **107** performs the process corresponding to the command as well as a reply process. Flow then proceeds to step S**610**, which is described below. In the case of commands that do not require performance of a reply process, such as a print command or an environment setting command, the device main unit **107** only performs the respective processes and the process on the device main unit **107** is completed.

If it is determined in the command analysis in step S**602** that the command is an acquisition command for acquiring the configuration information of the network interface **106**, the algorithm proceeds to step S**603**. The configuration information acquisition command is processed in step S**603**. More specifically, a configuration information acquisition is specified in an ATTN information register (step S**604**), and the ATTN signal **213** is switched on (step S**605**). The network interface **106** detects a trigger for printing the configuration information page, and the process illustrated in FIG. **7** is then started. The device main unit **107** then waits in a standby mode until a configuration information transmission command is received (step S**606**). Upon receiving the configuration information transmission command, the device main unit **107** prepares to transfer the configuration information transmission, as is, to the local client **103** (step S**609**). In step S**610**, the device main unit transmits the configuration information to the local client **103**. The process of the device main unit **107** is then completed.

FIG. **7** is a flow diagram illustrating a configuration information printing process of the network interface **106** of the present embodiment.

As previously discussed, the network interface **106** analyzes the control signals exchanged with the printer interface **205** and the device main unit **107**, and performs processes corresponding to the control signals (see FIG. **4**). When the network interface **106** detects the on state of the ATTN signal **213**, the content of the ATTN register is analyzed. The network interface **106** determines whether there is a configuration information acquisition request in the ATTN register (steps S**701** and S**702**). If the network interface **106** determines in step S**702** that there is a configuration information acquisition request, the algorithm proceeds to step S**703**, otherwise the algorithm proceeds to step S**707** for processing of the non-configuration information request. An example of such a request may be a request to report a status change.

In step S**703**, the configuration information is read from one of either the flash ROM **202** or the RAM **203**. In step S**704**, the configuration information of the network interface **106** is produced as a list of set values. In step S**705**, the configuration information is organized into a predetermined format. FIG. **8** illustrates one example of the format. The format depicted in FIG. **8** is text, and includes information such as parameter names, parameter values, as well as any

additional configuration information that can be added as needed. The network interface **106** transfers this information in step S**706**, together with the configuration information transmission command to the device main unit **107**. The process of the network interface **106** is then completed.

The printing process of the configuration information page discussed with respect to FIGS. **4** through **7** is summarized in FIG. **11**. If a print instruction is issued through a user interface, for example selecting menu **1002** of FIG. **10**, the configuration information acquisition command is issued to the device main unit **107** of printer device **105** (step S**503** of FIG. **5**). Upon receiving this command, the device main unit **107** describes the configuration information acquisition in the ATTN information register and switches on the ATTN signal **213** (steps S**601** through S**605** of FIG. **6**).

Upon detecting the switch-on of the ATTN signal **213**, the network interface **106** analyzes the content of the ATTN information register. If the network interface **106** determines that the content is the configuration information request, the network interface **106** sends the configuration information transmission command containing the configuration information thereof to the device main unit **107** (steps S**701**-S**706** of FIG. **7**). Upon receiving the configuration information transmission command, the device main unit **107** transfers, to the local client **103**, the configuration information in reply to the configuration information acquisition command received from the local client **103**.

As shown in FIG. **8**, the configuration information includes network setting parameters representing the operational status of the network interface **106**, and information concerning a device connected to the network interface **106**, such as operator information, position information, network names, and interface information.

The local client **103** receives the configuration information in reply to the configuration information acquisition command. Based on the received configuration information, the local client **103** generates a print job, thereby causing the device main unit **107** to print out the configuration information page (steps S**504**-S**506** of FIG. **5**). More specifically, the printer driver **304** in the local client **103** generates a print job in response to a command from an ordinary application, and further generates a new print job based on the configuration information transmitted from the device main unit **107**. FIG. **9** illustrates a printout of the print image data that is generated from the configuration information data of FIG. **8**.

When the network interface **106** converts the configuration information (step S**705** of FIG. **7**), a post-conversion format may contain print/non-print character information, and bold character information depending on a description method. The local client **103**, which has received the configuration information, is designed to switch the font and size of the print character string in the print job depending on the format description method.

The local client **103** includes the user interface to request a configuration information print. Such a user interface may also be arranged on the printer device **105** as an operation panel for example. In such a case, the device main unit **107** transfers, to the local client **103**, a configuration information print command and the configuration information received from the network interface **106**. Upon receiving the information, the local client **103** generates a print job based on the configuration information.

The device main unit **107** of the printer device **105** has been discussed. In a peripheral device having no printing function, such as a scanner, the configuration information of the network interface **106** may be displayed on the display **351** of the local client **103**. In this arrangement, a printer device connected in the local connection may print out the configuration information.

In accordance with this preferred embodiment, the environment setting information of the network interface **106** is printed on the printer device under a printing environment where a host PC is used to produce the print data (in the host base system).

The preferred embodiment of the present invention thus overcomes the drawback of a typical host base system that the configuration information of the dedicated network interface **106** directly connected to the printer device is not only printed on the printer device.

In the above-referenced preferred embodiment, the user immediately checks the information set on the network interface **106** on a sheet of paper. When the network environment is modified, or when the setting of the network interface **106** is modified, the user easily verifies the modification while storing parameter settings in the form of sheets of paper. When the network interface **106** is moved from one network environment to another, the knowledge of actually set values help simplify the installation operation of the network interface **106** in the new network environment. In the development of printer devices, the check of the version of the network interface **106** is easily performed.

In another preferred embodiment of the present invention, the configuration information of a network interface is transmitted to a client device (a network client) through a network. The network client generates a print job (namely, print image data) based on the configuration information, and transfers the print job to a printer device through the network. The configuration information is thus printed. This preferred embodiment of the present invention is discussed in detail below.

FIG. **12** is a functional block diagram of the network client devices **101** and **102** of FIG. **1**. The local clients **101** and **102** preferably use the Windows® operating system, but any operating system that would allow practice of the present invention is applicable.

Windows® application **1201** is a typical application program such as Microsoft Word® or Microsoft Excel®. A GDI/Spooler **1202** performs a spooling function, among other functions, between the application **1201** and a printer driver **1204**.

A language monitor **1203** divides the print data generated by the printer driver **1204** on a page-basis, and performs a screen process, a print order process, a collation process, a multi-copying process, and sheet size management process for selecting a sheet feeder on the print data. The resulting print data is transferred to a printer port **1206**. The language monitor **1203** also monitors the status of the printer device, and provides a status manager(not shown) with the printing status.

The printer driver **1204** generates image data in a bit-map format in accordance with a command from the application, compresses the image data, and outputs the compressed image data. A status window **1205** receives printer device status information from the language monitor **1203**, and displays the status information on a screen of the printer device. The status window **1205** displays a graphical user interface, receives a job control request in response to an input on the graphical user interface, and transfers a job control request to the language monitor **1203**. A port monitor **1206** communicates with one of the client devices **101** and **102**.

The configuration information of the network interface **106** is printed on the device main unit **107** in the host base system

in accordance with the preferred embodiment of the present invention. The printing operation of the host base system is discussed below.

In this preferred embodiment, a printer control command transmitted from the network client through the network is expanded, and a configuration information acquisition command (a command to print the configuration information page) is added to the printer control command. The network interface **106** processes this command, thereby allowing the configuration information thereof to be printed. The printing process of the configuration information in accordance with this preferred embodiment is now discussed.

FIG. **13** is a flow diagram illustrating a configuration information printing process of the network client devices **101** and **102**. Since network client devices **101** and **102** are identical, for description purposes, hereinafter references will only be made to network client device **101**, but are applicable to network client device **102**. Installed in the network client device **101** are the printer driver **1204**, the language monitor **1203**, and the status window **1205**, which are required for using the printer device. The status window **1205** is an application for presenting the status information of the printer device on the screen (i.e., display **351**) of the network client device **101**. FIG. **14** illustrates an example of graphical user interface **1400** displayed on the screen of the network client device **101** by the status window **1205**. The language monitor **1203** acquires the status information of the printer device **105** from the device main unit **107** through the network in accordance with control commands communicated between the network client device **101** and the device main unit **107**. Upon receiving the status information, the status window **1205** presents the status information on the screen of the network client device **101**.

When the loading of the network interface **106** in the printer device **105** is detected, a menu **1401** for commanding the printing of the configuration information page of the network interface **106** is added to the graphical user interface **1400** generated by the status window **1205**.

Returning to FIG. **13**, the status window **1205** is started in step S**1301**. The status window **1205** presents the menu **1401** for commanding the printing of the configuration information. By selecting the menu **1401**, a print command to print the configuration information is issued (step S**1302**). Alternatively, a button for printing the configuration information may be presented instead of the menu **1401**.

The status window **1205** communicates with the language monitor **1203**, thereby transmitting the print command to the language monitor **1203** (step S**1303**). The same process is followed to temporarily suspend the job. More specifically, commands are exchanged between the language monitor **1203** and the status window **1205**, and the configuration information print command is added to these commands. The language monitor **1203** issues a configuration information acquisition command as one of printer control commands through the port monitor **1206**.

In step S**1304**, the language monitor **1203** waits for a reply in response to the configuration information acquisition command. As will be discussed later, the reply command includes the configuration information of the network interface **106**. Upon receipt of the reply command in step S**1304**, the language monitor **1203** analyzes the configuration information included in the reply command, and generates print data (step S**1305**). The language monitor **1203** generates the print data in the same way as any other application typically generates print data. More specifically, the language monitor **1203** converts the configuration information into GDI data, which is then sent to a spooler. In step S**1306**, as is in the case of a typical printing operation, the printer driver **1204** converts the GDI data into a print image that is printable on the printer device **105**. The print image data is then transmitted from the network client device **101** to the network interface **106**, and then from the network interface **106** to the device main unit **107**. The printer device **105** prints out images in response to the image data. When a status monitor detects a print end state, a screen (now shown) displaying the configuration information print end state is displayed (step S**1307**). The process of the network client is then completed.

The network interface **106** analyzes the control signal received from the network as already discussed, and performs a process corresponding to the signal (see FIG. **4**). FIG. **15** is a flow diagram illustrating a process of printing the configuration information of the network interface **106** of the present embodiment. When the network interface **106** detects a command from the network, the content of the command is analyzed (steps S**1501** and S**1502**). If the network interface **106** determines in step S**1502** that the command is a configuration information acquisition command, step S**1503** and subsequent steps are executed. If the command is something other than a configuration information acquisition command, the algorithm proceeds to step S**1507**, where a process corresponding to the command is performed. The command may be for an ordinary printing process or a control process, and the process is performed in the same way as the conventional process.

In step S**1503**, the configuration information is read from one of either the flash ROM **202** or the RAM **203**. In step S**1504**, the configuration information of the network interface **106** is produced as a list of set values. In step S**1505**, the configuration information is organized into a predetermined format. FIG. **8** illustrates one example of the format. The network interface **106** transfers the information illustrated in FIG. **8** as a reply to the configuration information acquisition command to the client device **101** (step S**1506**). Upon receiving the reply, the client device **101** generates a print job based on the configuration information contained in the reply, as described with reference to FIG. **13**, and transfers the print job to the printer device **105**. The device main unit **107** prints out the configuration information in accordance with the print job. FIG. **9** illustrates a printout of the configuration information data. As shown, the configuration information includes a variety of pieces of information.

As described above, the printing system of the present invention includes the printer device and the information processing device connected to the printer device through the network. The information processing device (the client devices **101** and **102**) acquires the configuration information from the network interface **106** connected to the network (step S**1304** of FIG. **13**), and generates the print job based on the acquired configuration information (step S**1305** of FIG. **13**). The printer device prints out the configuration information page in accordance with the print job (step S**1306** of FIG. **13**).

The client device, which is essential to the network system, collects the configuration information from the network interface, and causes the printer to print out the configuration information. The configuration information of the network interface is printed in the host base system.

In the above-referenced preferred embodiment, the user immediately checks the information set on the network interface **106** on a sheet of paper. When the network environment is modified, or when the setting of the network interface **106** is modified, the user easily verifies the modification while storing parameter settings in the form of sheets of paper. In the

development of printer devices, the check of the version of the network interface **106** is easily performed.

In accordance the preferred embodiment of the present invention, the network interface is a network board or a network card to connect the printer device to the network. The present invention is not limited to the printer device. The present invention is applicable to print the configuration information of a network interface of a scanner. A host device acquires the configuration information from the network interface of the scanner, generates a print job, and transmits the print job to a printer device on the network.

In the above-referenced preferred embodiment, the information processing device (the client device) issues the command requesting the configuration information to the network interface **106** (step **S1303** of FIG. **13**). The network interface **106** transmits the configuration information described in a predetermined format to the information processing device in response to the command (steps **S1502**-**S1506** of FIG. **15**). To issue the command requesting the configuration information, an operational interface requiring the acquisition of the configuration information is presented on the user interface display provided by a driver of a peripheral device connected to the network interface (see FIG. **14**). The command is used in response to an operation on the interface.

In accordance the preferred embodiment, the produced print job contains the image data based on the configuration information. In this way, the host base printing system prints the configuration information of the network interface.

When the network interface **106** converts the configuration information (step **S1505** of FIG. **15**), a post-conversion format may contain print/non-print character information, and bold character information depending on a description method. The local client device **101**, which has received the configuration information, is designed to switch the font and size of the print character string in the print job depending on the format description method.

The local client device **101** includes the user interface to issue a configuration information print command. Such a user interface may also be arranged on the printer device **105** as an operation panel for example. In such a case, the device main unit **107** transfers a configuration information print command to the network interface **106**. Upon receiving the command, the network interface **106** transfers the configuration information thereof and the configuration information print command to the predetermined client device **101**. The client device **101** then generates the print job based on the configuration information, and causes the printer device **105** to perform a printing operation.

The configuration information includes network setting parameters representing the operational status of the network interface **106**, and information concerning a peripheral device connected to the network interface **106**. The information concerning the peripheral device contains among other things, operator information, position information, network name, and interface information.

The above-referenced preferred embodiment of the present invention provides the information processing device as a client computer appropriate for the printing system and the network interface. The information processing device, communicating with the printer device through the network, acquires the configuration information from the network interface **106** (steps **S1303** and **S1304** of FIG. **13**), generates the print job based on the acquired configuration information (step **S1305** of FIG. **13**), and transmits the generated print job to the printer device (step **S1306** of FIG. **13**).

To acquire the configuration information, the command requesting the configuration information is issued to the network interface. The configuration information described in the predetermined format is received from the network interface in response to the command.

The network interface connects the network to peripheral devices. The network interface determines the type of commands received through the network (step **S1502** of FIG. **15**). If the network interface determines that the received command is the configuration information requesting command, the network interface generates the configuration information thereof described in the predetermined format (steps **S1503**-**S1505** of FIG. **15**), and then transmits the generated data over the network in reply to the configuration information requesting command (step **S1506** of FIG. **15**).

A storage medium storing a program code of software for carrying out the functions of the above-described embodiments is loaded in a system or apparatus. A computer (a CPU or an MPU) in the system or apparatus reads and executes the program code from the storage medium, thus achieving the object of the present invention.

Since the program code of software performs the functions of the above-described embodiment, the program code itself, and means for providing the program code to the computer, for example, a storage medium for storing the program code, fall within the scope of the present invention.

Storage media for providing the program code include, but are not limited to, a floppy disk, a hard disk, an optical disk, a magneto-optical disk, a CD-ROM, a CD-R, a magnetic tape, a nonvolatile memory card, ROM, and the like.

By executing the program code read by the computer, the functions of the above-described embodiments are performed. Furthermore, the operating system running on the computer performs the process in whole or in part in response to instructions from the program code. The functions of the above-preferred embodiments are thus carried out. Such an arrangement falls within the scope of the present invention.

The program code from the storage medium is read into a memory incorporated in a feature expansion board in the computer or in a feature expansion unit connected to the computer. The CPU mounted on the feature expansion board or the feature expansion unit performs partially or entirely the actual process in response to the instruction from the program code. The functions of the above-described embodiments are executed through the process. Such a program code falls within the scope of the present invention.

The present invention thus provides a new printing system for printing the configuration information of the network interface. The conventional host base system has either been unable to print the configuration information or has been able to print the configuration information but at an extremely inefficient manner. The system of the present invention allows the configuration information to be easily printed out.

While the present invention has been described with reference to what are presently considered to be the preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, the invention is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

What is claimed is:

**1**. A printing system comprising:

a print control device;

a network interface device for connecting the print control device to a network;

an information processing device that is connected to the print control device through an interface different from the network interface device;

an input unit for inputting a print instruction for printing configuration information of the network interface device according to a user operation;

an acquisition unit, arranged in the print control device, for acquiring the configuration information representing a configuration of the network interface device from the network interface device when the print instruction is input;

a transmitting unit for transmitting the configuration information acquired by the acquisition unit from the print control device to the information processing device through the interface different from the network interface device;

a generating unit, arranged in the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information transmitted from the transmitting unit; and

a printing unit, arranged in the print control device, for printing the print data generated by the generating unit.

**2**. A printing system according to claim **1**, further comprising:

a command transmitting unit for transmitting, from the information processing device to the print control device, a command to acquire the configuration information in response to the print instruction; and

a print data transmitting unit for transmitting the print data generated by the generating unit from the information processing device to the print control device through the interface different from the network interface device.

**3**. A printing system according to claim **1**, wherein the acquisition unit transmits a signal to the network interface device through a dedicated signal line to acquire the configuration information of the network interface device.

**4**. A printing system according to claim **1**, further comprising, in the network interface unit, a configuration information generator for generating the configuration information in a predetermined format,

wherein the acquisition unit acquires the configuration information set in the predetermined format.

**5**. A printing system comprising:

a print control device;

a network interface device for connecting the print control device to a network;

an information processing device that is connected to the network;

an input unit for inputting a print instruction for printing configuration information of the network interface device according to a user operation;

an acquisition unit, arranged in the information processing device, for acquiring the configuration information representing a configuration of the network interface device from the network interface device through the network when the print instruction is input;

a generating unit, arranged in the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information acquired by the acquisition unit; and

a printing unit, arranged in the print control device, for printing the print data generated by the generating unit.

**6**. A printing system according to claim **5**, further comprising:

a command transmitting unit for transmitting, from the information processing device to the network interface device, a command to acquire the configuration information in response to the print instruction;

a first print data transmitting unit for transmitting the print data generated by the generating unit from the information processing device to the network interface device through the network; and

a second print data transmitting unit for transmitting, from the network interface device to the print control device, the print data transmitted from the first print data transmitting unit.

**7**. A printing system according to claim **5**, further comprising a generator, arranged in the network interface device, for generating the configuration information in a predetermined format,

wherein the acquisition unit acquires the configuration information set in the predetermined format.

**8**. A printing method for printing configuration information of a network interface device that connects a print control device to a network, the printing method comprising:

an inputting step for inputting a print instruction for printing configuration information of the network interface device according to a user operation;

an acquisition step, performed by the print control device, for acquiring the configuration information representing a configuration of the network interface device from the network interface device when the print instruction is input;

a transmitting step for transmitting the configuration information acquired in the acquisition step from the print control device to an information processing device through an interface different from the network interface device;

a generating step, performed by the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information transmitted in the transmitting step;

a print data transmitting step for transmitting the print data generated in the generating step from the information processing device to the print control device through the interface different from the network interface device; and

a printing step for printing the print data transmitted in the print data transmitting step.

**9**. A printing method for printing configuration information of a network interface device that connects a print control device to a network, the printing method comprising:

an inputting step for inputting a print instruction for printing configuration information of the network interface device according to a user operation;

an acquisition step, performed by an information processing device, for acquiring the configuration information representing a configuration of the network interface device from the network interface device through the network when the print instruction is input;

a generating step, performed by the information processing device, for generating print data representing the configuration of the network interface device based on the configuration information acquired in the acquisition step;

a first print data transmitting step for transmitting the print data generated in the generating step from the information processing device to the network interface device through the network;

a second print data transmitting step for transmitting the print data, transmitted in the first print data transmitting step, from the network interface device to the print control device; and

a printing step for printing the print data transmitted in the second print data transmitting step.

**10**. A computer-readable storage medium storing a computer program for causing a computer to print configuration information of a network interface device that connects a print control device to a network, the computer program comprising program codes for performing:

an inputting step for inputting a print instruction for printing the configuration information of the network interface device according to a user operation;

an acquisition step for acquiring, through an interface different from the network interface device, the configuration information representing a configuration of the network interface device from the print control device that has acquired the configuration information when the print instruction is input; and

a generating step for generating print data representing the configuration of the network interface device based on the configuration information acquired in the acquisition step; and

a printing step, performed by the print control device, for printing the print data generated in the generating step.

**11**. A computer-readable storage medium according to claim **10**, further comprises program code for performing a display step for displaying one of a button and a menu, each commanding a printing of the configuration information of the network interface device when a connection of the network interface device to the print control device is detected.

**12**. A computer-readable storage medium storing a computer program for causing a computer to print configuration information of a network interface device that connects a print control device to a network, the computer program comprising program codes for performing:

an inputting step for inputting a print instruction for printing the configuration information of the network interface device according to a user operation;

an acquisition step, performed by an information processing device, for acquiring the configuration information representing a configuration of the network interface device from the network interface device through the network when the print instruction is input;

a generating step, performed by the information processing device, for generating print data representing the configuration information of the network interface device based on the configuration information acquired in the acquisition step; and

a printing step, performed by the print control device, for printing the print data generated in the generating step.

**13**. A computer-readable storage medium according to claim **12**, further comprises program code for performing a display step for displaying one of a button and a menu, each commanding a printing of the configuration information of the network interface device when a connection of the network interface device to the print control device is detected.

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